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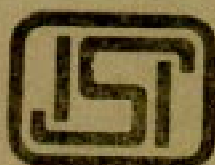
“Knowledge is such a treasure which cannot be stolen”

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Indian Standard
GUIDELINES FOR
HANDLING, STORAGE AND TRANSPORT
OF SLAUGHTER-HOUSE BY-PRODUCTS

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GUIDELINES FOR HANDLING, STORAGE AND TRANSPORT OF SLAUGHTER-HOUSE BY-PRODUCTS

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(Continued on page 2)

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(Continued from page 1)

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Indian Standard

GUIDELINES FOR HANDLING, STORAGE AND TRANSPORT OF SLAUGHTER-HOUSE BY-PRODUCTS

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 29 August 1978, after the draft finalized by the Meat Industry Sectional Committee had been approved by the Agricultural and Food Products Division Council.

0.2 There is a great potential for utilization of slaughter-house by-products for valuable pharmaceutical products, if these can be handled, stored and transported under appropriate conditions. This standard is intended to provide guidelines for such conditions, thereby saving sizeable quantities of this raw material for the pharmaceutical industries.

0.3 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard provides guidelines for proper handling, storage and transport of by-products of slaughter-houses and meat processing factories.

1.1.1 This standard does not include the guidelines for the processing of pharmaceutical products like insulin and pancreatin.

2. TERMINOLOGY

2.0 For the purpose of this standard, the following definitions in addition to those given in IS : 4393-1967† shall apply.

*Rules for rounding off numerical values (*revised*).

†Basic requirements for an abattoir.

2.1 Slaughter-House — The building, the premises or place which is licensed as a slaughter-house by the local authority for the slaughter of animals intended for human consumption.

2.2 By-Products — Slaughter-house wastes in the form of parts cut off as waste from carcasses especially edible or inedible offals, blood, etc, which are not normally intended to be utilized for human consumption.

3. ANTE-MORTEM AND POST-MORTEM INSPECTION

3.1 The by-products shall be obtained from animals subjected to proper ante-mortem and post-mortem inspection as per IS : 1982-1971*.

4. HANDLING, STORAGE AND TRANSPORT

4.1 Various by-products shall be handled and stored under conditions as recommended in Table 1.

TABLE 1 REQUIREMENTS FOR HANDLING, STORAGE AND TRANSPORT OF SLAUGHTER-HOUSE BY-PRODUCTS

SL No.	NAME OF BY-PRODUCTS	UTILIZATION	HANDLING, STORAGE AND TRANSPORT
(1)	(2)	(3)	(4)
i)	Blood	Human food and pharmaceuticals, such as plasma, albumin and fibrin	In case of utilization as human food slaughter should preferably be done on bleeding rails and the blood should be collected in clean receptacles. Where blood plasma is required, collection should be done in an anticoagulant immediately after slaughter of animals. Where fibrin is required, the blood should be stored at chilling temperatures (4 to 7°C) in a stainless steel container
		Livestock feed	In case of utilization for livestock feed, the blood should be collected in storage bins under conditions that prevent soiling with any extraneous materials. The bins should then be covered and transported immediately to (within 3-6 hours) processing units. Lime or any other permitted preservative may be added at the time of collection

(Continued)

*Code of practice for ante-mortem and post-mortem inspection of meat animals (first revision).

**TABLE 1 REQUIREMENTS FOR HANDLING, STORAGE AND
TRANSPORT OF SLAUGHTER-HOUSE BY-PRODUCTS — *Contd***

Sl No.	NAME OF By-PRODUCTS	UTILIZATION	HANDLING, STORAGE AND TRANSPORT
(1)	(2)	(3)	(4)
		Fertilizer and other commercial uses	Blood for processing into fertilizer may be collected by any of the above procedures and blood that has been soiled by regurgitated ingesta, floor and spilt blood may also be collected. Blood collected for food, pharmaceuti- cals or livestock feed if found unsuitable for any reason may also be included for processing into fertilizer stock. Blood should be collected and trans- ported within 4-6 hours to the processing unit in closed contain- ers. Addition of preservatives such as formalin or lysol may be done but these should be added only at locations where their use is permitted in the slaughter- house premises. For prolonged storage of blood, it should be stored at 4 to 10°C
ii)	Pancreas	Trypsin, insulin, pancreatin and chymotrypsin	<p>Pancreas should be removed expe- ditiously, preferably within 30 minutes after slaughter of the animal to prevent a tolysis. The glands should be collected into a stainless steel or aluminium vessel and chilled (4°C) or frozen immediately. Direct contact of ice or freezing mixtures with the tissues should be avoided</p> <p>After the tissue is chilled or frozen, it should be packaged in strong fibre boxes lined with thermocole or several layers of wax paper to protect the glands from thawing. Each container should be tightly filled to the top to give mini- mum air space. The glands shall be transported and stored under refrigerated conditions</p>

(Continued)

TABLE 1 REQUIREMENTS FOR HANDLING, STORAGE AND TRANSPORT OF SLAUGHTER-HOUSE BY-PRODUCTS — Contd

SL No.	NAME OF BY-PRODUCTS	UTILIZATION	HANDLING, STORAGE AND TRANSPORT
(1)	(2)	(3)	(4)
iii)	Endocrine glands	Harmones like pituitrin, thyroxine and adrenalin	The endocrine glands should be collected immediately after slaughter and preserved under frozen conditions, similar to the pancreas
iv)	Liver	Liver extract, glycogen, vitamin B ₁₂ , etc	The livers should be removed without soiling and collected into stainless steel or aluminium containers provided with lids. These should be transported within 1 to 2 hours to processing unit and stored at cold storage temperature (4°C)
v)	Intestines	Casings, surgical sutures, etc	Primary cleaning which involves separation of intestines from mesentry and, removal of intestinal contents should be done in the slaughter-house. Further cleaning should be done within 1 to 2 hours at the processing unit. These should be transported to the place of processing preferably in any closed container like rust-free tins, polyethylene containers, or bags or closely woven baskets
vi)	Bile secretions	Bile salts	<p>The gallbladder should be removed from the liver as soon as possible and the bile contents emptied immediately into a clean vessel through a fine screen to prevent any stones, parasites, etc, from passing through</p> <p>Bile if stored for long periods should be preserved by addition of permitted anti-microbial agents depending on the end-product or frozen until use. Bile should be transported in closed containers preferably polyethylene or similar non-reactive materials and stored as above</p>

(Continued)

TABLE 1 REQUIREMENTS FOR HANDLING, STORAGE AND TRANSPORT OF SLAUGHTER-HOUSE BY-PRODUCTS — Contd

SL No.	NAME OF BY-PRODUCTS	UTILIZATION	HANDLING, STORAGE AND TRANSPORT
(1)	(2)	(3)	(4)
			Another method of preservation is by concentration of bile to change it to a syrup
vii)	Lungs	Heparin	Lungs are liable to rapid putrefaction. This should be prevented by addition of a suitable permitted anti-microbial agents. The tissue should then be stored for limited period at room temperature (25 to 35°C)
viii)	Testes	Hyaluronidase	The testes should be immediately collected in containers chilled in ice to protect the activity of hyaluronidase
ix)	Trimmings and stomach	Proteose, peptone	The trimmings and stomach should, as far as possible, be collected from slaughter-house or meat processing factories immediately after the slaughtering and processing operations. Stomachs should be collected after emptying the ingesta in the offal washing area provided for the purpose, washed in water free of any adhering ingesta and transported at the earliest in closed containers to the processing units
x)	Brain and spinal cord	Cholesterol	Same as for lungs
xi)	Pig stomachs	Renin and pepsin	The pig stomach lining should be peeled off, cut into four pieces and frozen in trays. The lining should be preserved by covering with one percent solution of sulphuric acid (30 ml of commercial sulphuric acid added into one litre of water) in a large glass jar or enamelled containers. The lining should be transported to the pharmaceutical industry while still submerged in the original acid

(Continued)

**TABLE 1 REQUIREMENTS FOR HANDLING, STORAGE AND
TRANSPORT OF SLAUGHTER-HOUSE BY-PRODUCTS — *Contd***

SL No.	NAME OF BY-PRODUCTS	UTILIZATION	HANDLING, STORAGE AND TRANSPORT
(1)	(2)	(3)	(4)
xii)	Hides and skins	Leather	Hides and skins should be collected and transported to place of storage within 8 hours. Hides should preferably be salted before storage
xiii)	Tail hair, bristles and body hair	Brushes	Generally, tail hair bristles and body hair should be separated and transported within 8 to 10 hours
xiv)	Bones	Gelatin, glue	The bones should be freed of adhering flesh and dried. Green bones should be broken, cooked and dried. In case of desert bones, they should be neatly laid out on a sloping cement platform in the collection centres. During dry weather, the bones should be sprayed with water to encourage bacterial and insect action, and to wash off unwanted material. Care should be taken not to dry bones in direct contact with earth. Further cooking and processing is similar to green bones
xv)	Hooves and horns	Buttons, handles, combs, horn meal, foam compound, etc	Hooves and horns freed of pith should be collected and transported to be stored in cool sheds. These should not be exposed to undue heat and desiccation during collection, transport and storage as these may crack or become brittle
xvi)	Horn pith	Gelatin	Horns should be placed in boiling water for a short period to remove any blood, fat or adhering tissue and pith removed by a gentle tap. The pith should then be cleaned free and stored in mesh-like containers for transport
